

## Taxonomic Study of Korean Cantharidae (Coleoptera)

### VI. Three New Species from Is. Jejudo, Korea

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**Abstract** Three new species, *Asiopodabrus oreumsensis* sp. nov., *Asiopodabrus asperipunctatus* sp. nov. and *Athemus (Andrathemus) jejuensis* sp. nov. are described from Is. Jejudo, Korea. Illustrations of the habitus and the aedeagus are provided for each species.

The Korean Cantharidae was enumerated as twenty-nine species of twelve genera belonging to four subfamilies by KIM and KANG (2000), KANG, KIM and KIM (2000), and KANG and KIM (2000 a, b, 2002). KANG and KIM (2000 a) dealt with *Hatchiana* and *Asiopodabrus* as subgenera of the genus *Podabrus*, but since they were raised to the generic rank on the basis of recent morphological studies (IMASAKA, 2001; TAKAHASHI, 2002), we also regard the Korean species as belonging to independent genera.

The volcanic island, Is. Jejudo (=Chejudo) lying on the southwestern sea of Korea has a mild oceanic climate. It has been introduced to the West since 1642 as Quelpart Island. At the center of the island stands Mt. Hallasan, 1,950 m in height. For these reasons, the island has the flora and fauna originating from various places, from the subtropics to the subarctics. As the result, it serves as a habitat for many organisms that cannot be found on the mainland of the Korean Peninsula.

Up to the present time, six species of five genera of the Cantharidae have been recorded from Is. Jejudo (LEE & KWON, 1974; LEE *et al.*, 1985; KANG & KIM, 2000 a, b; KANG, KIM & KIM, 2000). In this paper, we are going to describe newly three species, *Asiopodabrus oreumsensis* sp. nov., *Asiopodabrus asperipunctatus* sp. nov. and *Athemus (Andrathemus) jejuensis* sp. nov. from the island. Of these, *A. (A.) jejuensis* is also recorded from the mainland of Korea. As the result, the Cantharidae from Is.

Table 1. List of the Cantharidae from Is. Jejudo.

No.	Species	Korean Name
1	<i>Hatchiana glochidiatus</i> (KAZANTSEV, 1996), comb. nov.	등 점 목 가는 병 대 벌 레
2	<i>Asiopodabrus asperipunctatus</i> KANG et OKUSHIMA, sp. nov.	거친 목 가는 병 대 벌 레
3	<i>Asiopodabrus fragiliformis</i> (KANG et KIM, 2000), comb. nov.	연 노 랑 목 가는 병 대 벌 레
4	<i>Asiopodabrus circumangulatus</i> (KANG et KIM, 2000), comb. nov.	원 통 목 가는 병 대 벌 레
5	<i>Asiopodabrus oreumsensis</i> KANG et OKUSHIMA, sp. nov.	오름 목 가는 병 대 벌 레
6	<i>Athemus (Andrathemus) vitellinus</i> (KIESENWETTER, 1874)	회 황 쪽 병 대 벌 레
7	<i>Athemus (Andrathemus) jejuensis</i> KANG et OKUSHIMA, sp. nov.	제주 어리 병 대 벌 레
8	<i>Cantharis (Telephorus) tenuelimbata</i> BALLION, 1870	대륙 병 대 벌 레
9	<i>Rhagonycha</i> (s. str.) <i>transita</i> WITTMER, 1971	꼬마 산 병 대 벌 레

Jejudo consists of nine species belonging to five genera as is shown in Table 1.

### Acknowledgements

We wish to express our deep gratitude to Dr. Shun-Ichi UÉNO of the National Science Museum (Nat. Hist.), Tokyo, for critically reading the manuscript of this paper. Our hearty thanks are also due to Dr. Masataka SATÔ, Nagoya, Mr. Kazuhiro TAKAHASHI, Hiratsuka, Dr. Jin Ill KIM of Sungshin Women's University, Dr. Hae Chul PARK and Dr. Jung Sun YOO of the National Institute of Agricultural Science and Technology for their constant guidance and co-operation to our studies.

### Materials and Methods

The materials used in this paper are deposited in the collections of Ehime University, Matsuyama (EUM), Kurashiki Museum of Natural History (KURA) and the National Institute of Agricultural Science and Technology, Division of Insect Resources (NIAST).

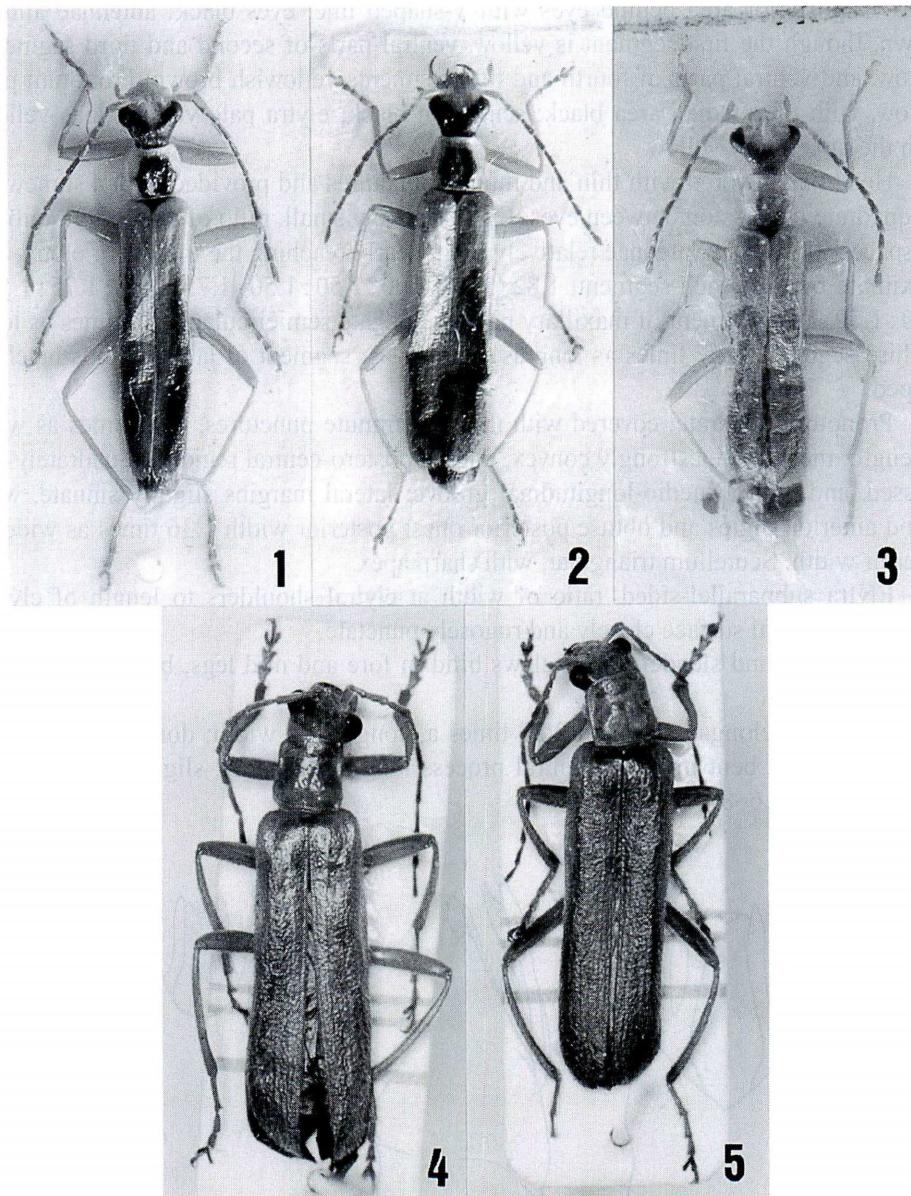
Descriptions and illustrations were prepared by using the stereoscopic microscope (Olympus SYX 12 and Nikon SMZ-10). The photos of habitus were taken with digital camera (Nikon Coolpix 4500).

### Systematics

#### *Asiopodabrus oreumsensis* KANG et OKUSHIMA, sp. nov.

(Figs. 1-2, 6-8)

Male (Fig. 1). Body mostly pale yellow; head pale yellow in anterior area, but



Figs. 1-5. Cantharidae from Is. Jejudo, Korea. — 1-2. *Asiopodabrus oreumsensis* KANG et OKUSHIMA, sp. nov.; 1, ♂ (holotype); 2, ♀ (allotype). — 3. *Asiopodabrus asperipunctatus* KANG et OKUSHIMA, sp. nov., ♂ (holotype). — 4-5. *Athemus (Andrathemus) jejuensis* KANG et OKUSHIMA, sp. nov.; 4, ♂ (holotype); 5, ♀ (allotype).

black in posterior area behind eyes with V-shaped line; eyes black; antennae almost brown, though the first segment is yellow, ventral parts of second and third segments yellow, and ventral parts of fourth and fifth segments yellowish brown; pronotum pale yellow, with the median area black; scutellum black; elytra pale yellow; legs yellow, with the tarsi dusky yellow.

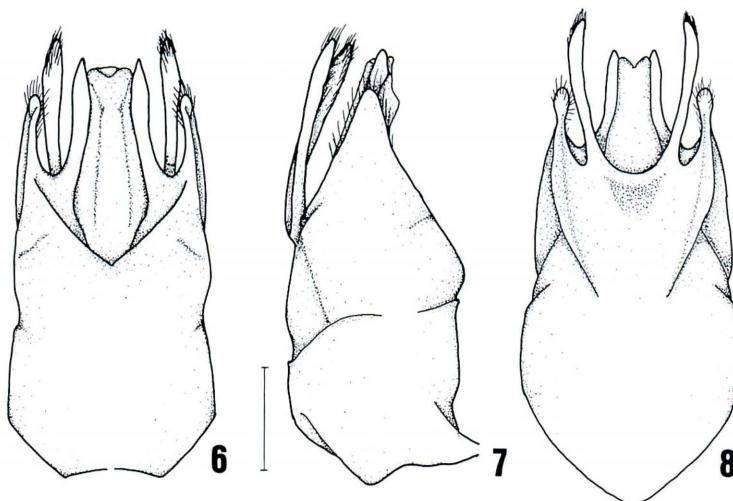
Head flat, covered with thin and minute punctures and provided with a somewhat subquadrate depression between eyes. Eyes relatively small, ratio of an eye to interocular space 1.00 : 4.89. Antennae relatively long, nearly reaching the middle of elytra, approximate ratio of each segment, 1.82 : 1.00 : 1.00 : 1.50 : 1.50 : 1.75 : 1.75 : 1.75 : 1.50 : 1.50 : 1.50. Last segment of maxillary palpus elongate semicircular, 2.50 times as long as third segment, 1.67 times as long as second; last segment of labial palpus hatchet-shaped.

Pronotum quadrate, covered with thin and minute punctures, 1.03 times as wide as length; median area strongly convex, but the postero-central region is quadrately depressed, and with a medio-longitudinal groove; lateral margins slightly sinuate, with round anterior angles and obtuse posterior ones; posterior width 1.36 times as wide as anterior width. Scutellum triangular, with sharp apex.

Elytra subparallel-sided, ratio of width at elytral shoulders to length of elytra, 1.00 : 3.86; dorsal surface closely and rugosely punctate.

Legs long and slender; tarsal claws bifid in fore and mid legs, bluntly toothed in hind one.

Aedeagus elongate; tegmen 2.27 times as long as its width; dorsal process long and slender and bent inwards; ventral process long and slender, slightly expanded at basal part (Figs. 6-8).



Figs. 6-8. Aedeagus of *Asiopodabrus oreumsensis* KANG et OKUSHIMA, sp. nov.; 6, ventral view; 7, lateral view; 8, dorsal view. (Scale: 0.3 mm.)

Body length: 8.22 mm (in the holotype; elytral shoulder:body length=1.00:5.43)

Female (Fig. 2). Body color duskier than in the male; body somewhat longer and wider than in the male (body length in the allotype=8.23 mm); head and pronotum covered with closer punctures than those in the male. Eyes relatively smaller than in the male (ratio of eye diameter: interocular space in the allotype=1.00:5.00). Medio-longitudinal groove of pronotum evanescent in the allotype, but it often appears as in the male. Scutellum linguiform with obtuse apex. Each tarsal claw of all legs provided with a blunt basal tooth.

*Type series.* Holotype: ♂, Is. Chejudo, Mt. Hallasan (area between Oreumse and Uioreumse), 11-VI-2000, Y. B. LEE leg. (NIAST). Allotype: ♀, same data as for the holotype (NIAST). Paratypes: Is. Jejudo: 12♂♂, 17♀♀, same data as for the holotype (NIAST); 2♂♂, Sum Gum Puli, 30-IV-1991, Y. NOTSU leg. (EUM); 1♀, Shiitakegoya, 800 m alt., Mt. Hanna (=Hallasan), 14-VII-1968, T. SHIRŌZU & Y. NISHIDA leg. (EUM); 2♂♂, Ryuzinkaku, 1,600 m alt., Mt. Hanna, 16-VII-1968, T. SHIRŌZU leg. (EUM); 2♂♂, 1♀, Ryuzinkaku, 1,600 m alt., Mt. Hanna, 17-VII-1968, T. SHIRŌZU leg. (EUM); 2♂♂, Ryuzinkaku, 1,600 m alt., Mt. Hanna, 17-VII-1968, Y. NISHIDA leg. (EUM); 1♀, Ryuzinkaku, 1,600 m alt., Mt. Hanna, 18-VII-1968, T. SHIRŌZU leg. (EUM); 1♂, Kannonji, 600 m alt., Mt. Nanna (=Hallasan), 20-VII-1968, T. SHIRŌZU & Y. NISHIDA leg. (EUM); 1♂, Sum Gum Puli, 30-IV-1991, Y. NOTSU leg. (EUM); 1♀, Hahlsan (=Hallasan), 750 m alt., Song Panak, 2-V-1991, Y. NOTSU leg. (EUM).

*Etymology.* The specific name *oreumsensis* is based on the collecting site, Mt. Hallasan. “Oreumse” means a secondary volcano or mountain in local language of Is. Jejudo.

*Korean name.* Oreum-mogganeun-byeongdaebeolle (see Table 1).

*Distribution.* Korea: Is. Jejudo.

*Notes.* According to the key to the groups of the genus *Asiopodabrus* proposed by TAKAHASHI and KIRIYAMA (2000), this new species should belong to the *macilentus* group. It is very similar to *A. kiiensis* (NAKANE et MAKINO, 1989) from Japan and *A. circumangulatus* (KANG et KIM, 2000) from the Korean Peninsula, but is easily distinguished from them by the following points:

From *A. kiiensis*: blackish portion behind eyes with V-shaped line; pronotum a little wider than length, widest at the middle; each processes of aedeagus more widely parted from each other; each ventral process of aedeagus well expanded near the apex.

From *A. circumangulatus*: no longitudinal groove between eyes; median longitudinal groove on pronotum not reaching anterior margin; scutellum sharp at apex in male; punctures on body minute and sparse; dorsal processes of aedeagus bent inwards and ventral processes slightly expanded at each basal part.

*Asiopodabrus asperipunctatus* KANG et OKUSHIMA, sp. nov.

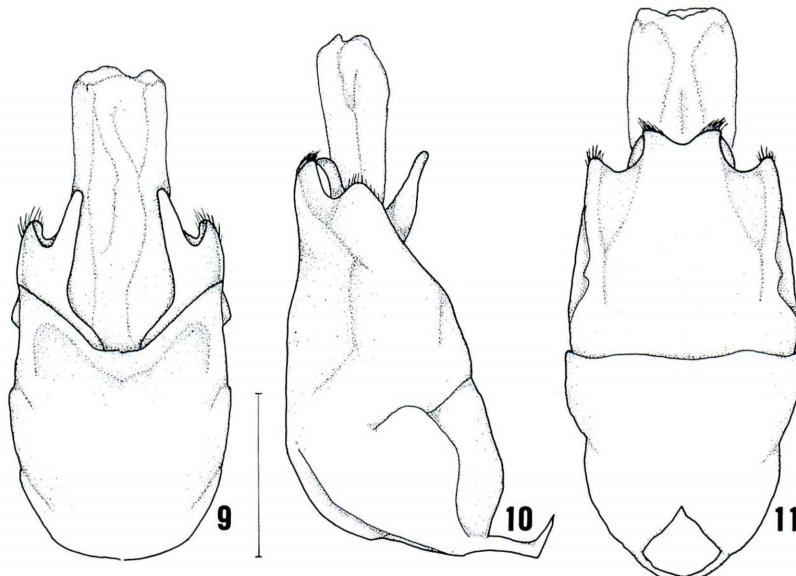
(Figs. 3, 9–11)

Male (Fig. 3). Body mostly pale yellow; head pale yellow in anterior area, but black in posterior area behind eyes; eyes black; antennae almost blackish brown, though each articulation is yellowish brown, first and second segments yellow, third and eleventh yellowish brown; pronotum pale yellow, with the postero-medial area black, scutellum black; elytra pale yellow.

Head flat; surface minutely punctate in anterior portion before eyes, but strongly punctate in posterior portion; interocular area slightly and triangularly depressed. Eyes relatively small, ratio of the diameter of an eye to interocular space, 1.00 : 4.50. Antennae relatively short, nearly reaching basal third of elytra, ratio of antennal segments, 1.63 : 1.00 : 1.00 : 1.16 : 1.16 : 1.33 : 1.16 : 1.16 : 1.00 : 1.00 : 1.33. Last segment of maxillary palpus elongate hatchet-shaped, 2.00 times as long as the third one, 1.25 times as long as the second; last segment of labial palpus hatchet-shaped.

Pronotum quadrate, 1.04 times as wide as length and strongly punctate on disc and minutely so in lateral areas; median area strongly convex, though the postero-central portion is strongly depressed, with a medio-longitudinal groove; lateral margins sinuate, with angulate anterior and sharp posterior angles; posterior width 1.37 times as wide as anterior width. Scutellum triangular with rounded apex.

Elytra subparallel-sided, ratio of width at shoulders to length of elytra, 1.00 : 3.54; dorsal surface covered with close and rugose punctures.



Figs. 9–11. Aedeagus of *Asiopodabrus asperipunctatus* KANG et OKUSHIMA, sp. nov.; 9, ventral view; 10, lateral view; 11, dorsal view. (Scale: 0.3 mm.)

Legs long and slender; each tarsal claw bifid in fore and mid legs, bluntly toothed in hind legs.

Aedeagus oval; tegmen 1.94 times as long as its width; dorsal processes very short, conjointly forming a wide dorsal plate with acute corner on each side of terminal margin; postero-lateral margins sinuate. Laterophyses bent upwards, exposed to apex of posterior portion of dorsal plate. Each ventral process expanded at base, and narrowed apically (Figs. 9–11).

Length of body 5.35 mm (elytral shoulder: body length = 1.00 : 4.20).

Female. Unknown.

*Type series.* Holotype: ♂, Is. Chejudo, Mt. Hallasan (area between Oreumse and Uioreumse), 11–VI–2000, Y. B. LEE leg. (NIAST). Paratypes: 1♂, same data as for the holotype (NIAST); 3♂♂, Sogwipo, Chejudo, 1–V–1991, Y. NOTSU leg. (EUM).

*Etymology.* The specific name *asperipunctatus* is based on morphological peculiarity. The body surface of this species looks rough due to many small punctures particularly on head and pronotum. *Asper* means rough in Latin, and *punctatus* means punctate in the same language.

*Korean name.* Geochin-mogganeun-byeongdaebeolle (see Table 1).

*Distribution.* Korea: Is. Jejudo.

*Notes.* According to the key to the groups of the genus *Asiopodabrus* proposed by TAKAHASHI and KIRIYAMA (2000), this new species falls in the *inexpectus* group. It is very similar in external features to *A. tsuboneae* (TAKAHASHI et KIRIYAMA, 2000) from Japan, but is distinguished from the latter by the following points: body color paler; the anterior part of pronotum narrower; each ventral process of aedeagus expanded at the basal part.

#### *Athemus (Andrathemus) jejuensis* KANG et OKUSHIMA, sp. nov.

(Figs. 4–5, 12–15)

Male (Fig. 4). Body mostly yellow. Eyes black; mandibles and claws reddish brown; antennae, 4th tarsal segments, metasternum and abdominal sternites somewhat dusky. Body closely covered with fine yellowish pubescence; apical margin of clypeus fringed with yellowish bristles; each elytron provided with yellowish bristles intermingled with primary pubescence.

Body moderately slender. Head slightly shorter than its width; dorsum depressed along the apical margin of clypeus and in lateral areas before eyes; surface smooth with faint luster, sparsely with minute and indistinct punctures; apical margin of clypeus arcuate with its center faintly indented; eyes large, globular and strongly prominent, ratio of the diameter of an eye to interocular space 1.00 : 1.55; apical segment of labial palpus blunt triangular; apical segment of maxillary palpus brief ensiform; antennae filiform and slender, attaining to the middle of elytra, 1st segment clavate, second short and a little expanded apicad, third to eleventh subcylindrical, each of fourth to seventh segments with a short groove on the dorso-external side, rela-

tive lengths of antennal segments as follows:— 17:10:15:19:19:18:18:17:17:16:—.

Pronotum subquadrate, faintly expanded posteriad, 0.87 times (in the holotype; range 0.81–0.87) as wide as head, 1.00 (1.00–1.07) times as long as wide; anterior margin arcuate; posterior margin weakly arcuate; lateral margins sinuate, weakly hollowed behind anterior angles and constricted just before posterior angles; anterior angles rounded; posterior angles obtuse; disc convex, particularly so in the postero-lateral areas, strongly depressed along the posterior margin, antero-lateral areas hollowed; medio-longitudinal furrow distinct in posterior area; surface smooth with faint luster. Scutellum triangular with blunt apex.

Elytra conjointly 1.62 (1.62–1.67) times as wide as pronotum, 2.95 (2.95–3.06) times as long as wide, the sides subparallel though slightly convex at basal fourth; dorsum closely and rugosely punctate, though weakly in basal part; each elytron provided with two vague costae.

Legs considerably slender; each femur mostly straight; each tibia feebly arcuate; each outer claw of fore and middle legs provided with a digitiform tooth, other claws simple.

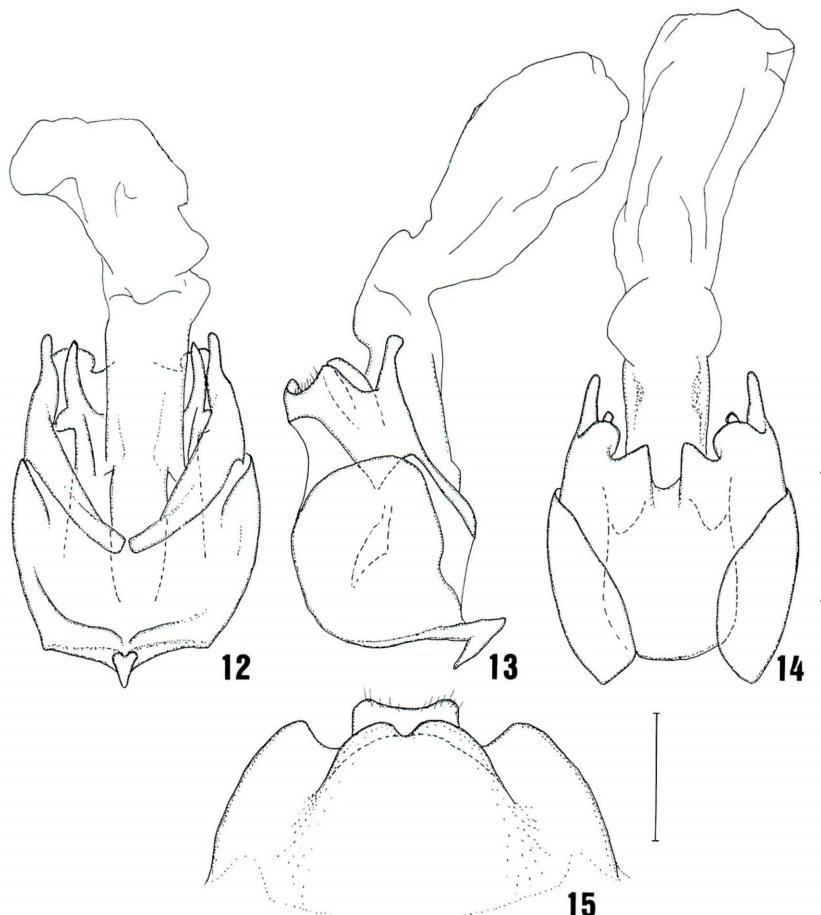
Aedeagus stout. Ventral process of each paramere mostly straight and leaning ventrad, the apex expanded; apical margin of each dorsal plate roundly expanded on lateral side, acutely angular on inner side. Each laterophysis curved towards the apex of each dorsal plate with pointed tip. Inner sac lengthened behind and ventrad, as long as tegmen (Figs. 12–14).

Length of body: 11.20 mm (in the holotype; range 10.60–11.20 measured from the anterior margin of clypeus to the apices of elytra); breadth of body: 2.75 (2.50–2.75) mm (measured at the widest part of conjoint elytra).

Female (Fig. 5). Body somewhat longer and wider than in the male. Eyes not so large as in the male, ratio of the diameter of an eye to interocular space 1.00:1.90. Antennae a little shorter than in the male and lacking groove on each segment. Pronotum 0.85–0.95 times as wide as head, 0.91–0.98 times as long as wide. Elytra conjointly 1.49–1.62 times as wide as pronotum, 2.95–3.06 times as long as wide. Eighth abdominal sternite deeply emarginate on each side of terminal margin, forming subtriangular lateral lobes and a wide median lobe, the latter of which is feebly concave at the apical margin and rounded on each side; disc swollen in the central area, the top overhanging apicad with a notch at the middle (Fig. 15).

Length of body: 10.3–11.1 mm; breadth of body: 2.50–2.75 mm.

*Type series.* Holotype: ♂, Ryuzinkaku, alt. 1,600 m, Mt. Hanna, Chejudo Is., Korea, 17–VII–1968, T. SHIRÔZU leg. (EUM). Allotype: 1 ♀, Ryuzinkaku, alt. 1,600 m, Mt. Hanna, Chejudo Is., Korea, 17–VII–1968, Y. NISHIDA leg. (EUM). Paratypes: 1 ♂, Jeolla-nam-do, Korea: Valley of Piagol, Mt. Jirisan, Gurye-gun, 26–VI–1996 (NIAST); Jejudo Is., Korea: 1 ♂, 1 ♀, Ryuzinkaku, alt. 1,600 m, Mt. Hanna, 16–VII–1968, T. SHIRÔZU leg. (KURA, EUM); 1 ♀, Yongsil, 10–VI–1991, no collector's name (KURA); 1 ♀, Lower stream of Gangjeongcheon, Bokpan-Dong,



Figs. 12–15. *Athemus (Andrathemus) jejuensis* KANG et OKUSHIMA, sp. nov. — 12–14, Aedeagus (12, ventral view; 13, lateral view; 14, dorsal view); 15, 8th abdominal sternite in female. (Scale: 0.5 mm.)

16–IV–1998 (NIAST); 1♂, Stream of Uidocheon, Bukjeju-gun, 25–V–1996 (NIAST); 2♀♀, Oreumse–Uioreumse, Mt. Hallasan, 11–VI–2000, Y. B. LEE leg. (NIAST).

*Etymology.* The specific name is derived from the name of the type locality.

*Korean name.* Jeju-eori-byeongdaebeolle (see Table 1).

*Distribution.* Korea: Jeollanam-do, Mt. Jirisan; Is. Jejudo.

*Notes.* This new species closely resembles *A. (Andrathemus) vitellinus* (KIESENWETTER, 1874) from Japan, but can easily be distinguished from the latter by the wholly yellow pronotum, characteristic dorsal plates of the male genitalia, and the well swollen 8th abdominal sternite in the female.

The last apical segments are missing in both the antennae in the holotype.

## 要 約

Tae Hwa KANG・奥島雄一：韓国産ジョウカイボン科の分類学的研究VI. 済州島の3新種。——これまで韓国済州島からは6種のジョウカイボン科甲虫が記録されていたが、今回われわれは、新たに *Asiopodabrus oreumsensis* KANG et OKUSHIMA, sp. nov., *A. asperipunctatus* KANG et OKUSHIMA, sp. nov., *Athemus (Andrathemus) jejuensis* KANG et OKUSHIMA, sp. nov. の3新種を同島から記載した。これらのうち、*Asiopodabrus*属の2種は今のところ同島特産で、*A. (A.) jejuensis*のみ韓国本土からも記録された。また、いずれの種も韓国本土あるいは日本本土に近縁種が認められた。*A. oreumsensis*は *macilentus*群に属し、日本から知られているキイクビボソジョウカイ *A. kiensis* (NAKANE et MAKINO, 1989) に酷似するが、前胸背板がやや横長であること、雄交尾器の背面突起がよく離れること、腹面突起が先端近くでよく広がることなどで区別できる。また、本種は韓国本土から知られている *A. circumangulatus* (KANG et KIM, 2000) にも近縁であるが、複眼間に縦溝を欠くこと、前胸背板の中央縦溝が前縁に届かないこと、体表の点刻が小さくまばらであること、雄交尾器の背面突起が内側に曲がり、腹面突起の基部がやや広がることなどで区別できる。*A. asperipunctatus*は *inexpectus*群に属し、日本の本州から知られている *A. tsu-boneae* (TAKAHASHI et KIRIYAMA, 2000) にもっとも近縁であるが、体色がより薄いこと、前胸背板前方部がより狭いこと、雄交尾器の腹面突起の基部が広がることで区別できる。*A. (A.) jejuensis*は、琉球を除く日本と韓国本土に分布するセボシジョウカイ *A. (A.) vitellinus* (KIESENWETTER, 1874) に近縁であるが、前胸背板が全体に黄色であること、雄交尾器の背板が特異な形態をしていること、雌の第8腹板中央部がよく膨らんでいることなどで区別される。

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*Elytra, Tokyo*, **31** (2): 351–352, November 22, 2003

## Further Records of "Athemellus multilimbatus" (Coleoptera, Cantharidae) from Taiwan

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OKUSHIMA and SATÔ (1999) revised Taiwanese *Habronychus* WITTMER, and newly described a subgenus, *Monohabronychus*. They recorded seven species of *Habronychus* from the island. Now, I will add an eighth species to the Taiwanese fauna, which was previously known as a member of *Athemellus*. I will simply record it with some collecting data from Taiwan.

### *Habronychus (Monohabronychus) multilimbatus* (PIC), comb. nov.

*Podabrus multilimbatus* PIC, 1911, *Le Naturaliste*, **32**: 271.

*Podabrinus multilimbatus*: WITTMER, 1954, *Revue suisse Zool.*, **61**: 275.

*Pseudoabsidia multilimbatus*: WITTMER, 1969, *Mitt. schweiz. ent. Ges.*, **42**: 128 [genus incertae sedis].

*Athemellus multilimbatus*: WITTMER, 1972, *Ent. Arb. Mus. Frey*, **23**: 126 [genus incertae sedis]; 1983, *Ent. Rev. Japan*, **38**: 171.

*Podabrinus? humeralis* WITTMER, 1952, *Ent. Bl.*, **47** [1951]: 100.

*Podabrinus humeralis*: WITTMER, 1955, *Mushi, Fukuoka*, **29**: 40, tab. 4, fig. 3.

*Pseudoabsidia humeralis*: WITTMER, 1969, *Mitt. schweiz. ent. Ges.*, **42**: 128 [genus incertae sedis].

*Athemellus humeralis*: WITTMER, 1972, *Ent. Arb. Mus. Frey*, **23**: 124.

*Specimens examined.* [Taiwan]: 6♂♂, 5♀♀, Lala-shan, Taoyuan Hsien, 4–IV–1991, Y. OKUSHIMA leg.; 1♂, Ssuleng, 1,300 m alt., Taoyuan Hsien, 23–III–1991, A. SHINOHARA leg.; 1♂, 1♀, Tzudran, Taoyuan Hsien, 28–IV–1982, N. OHBAYASHI leg.; 1♂, Kukuan, Taichung Hsien, 11–IV–1991, Y. OKUSHIMA leg.; 1♂, Hwei-sun, Nantou Hsien, 3–III–1990, C.-L. Lî leg.; 1♂, Sungkang, Nantou Hsien, 18–V–1965, T. SHIRÔZU leg.; 1♀, Sungkang, Nantou Hsien, 12–IV–1991, Y. OKUSHIMA leg.; 2♂♂, 2♀♀, Sungkang, Nantou Hsien, 15–V–1994, T. KISHIMOTO leg.; 1♀, Nanshanchi, Nantou Hsien, 6–IV–1993, T. NONAKA leg.; 1♂, Nanshanchi, Nantou